

Application No. 09/605,085
Response to Office Action of January 22, 2004

REMARKS

In the Office Action of January 22, 2004, claims 1-20 stand rejected. Claims 1,3, 6, 7 and 13 have been amended. Claims 8 and 20 have been canceled without prejudice or waiver. New claims 21 and 22 are presented. Reconsideration and allowance of all pending claims are respectfully requested in view of the following remarks. No new subject matter is being added by this response.

I. CLAIM REJECTIONS.

A. 35 U.S.C. § 103 Rejections.

Claims 1-14 and 16-20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,104,926 issued to Hogg (hereinafter "*Hogg*") in view of U.S. Patent No. 5,557,656 to Ray (hereinafter "*Ray*") or Slides from an ARCSS presentation (hereinafter "*ARCSS*") or PCT Publication No. WO9602094 to Gilhousen (hereinafter "*Gilhousen*") and U.S. Patent No. 6,601,562 to Martin et al. (hereinafter "*Martin*"), U.S. Patent No. 6,275,187 to Ross (hereinafter "*Ross*"), EP Patent EPO803742 to Upton (hereinafter "*Upton*"), U.S. Patent No. 6,061,561 to Alanara et al. (hereinafter "*Alanara*") and U.S. Patent No. 5,509,051 to Barnett et al. (hereinafter "*Barnett*"). Specifically, the Examiner argues that *Hogg* (or *Ray*, *ARCSS* or *Gilhousen*) teaches a method of maintaining a terrestrial cell site handoff list for airborne cellular systems. The Examiner further argues that *Martin* teaches maintaining a fixed beam pattern of beams transmitted from an airplane and determining the locations of cell sites within the respective beams. The Examiner further argues that *Martin*, *Ross*, *Upton* and *Alanara* all disclose obtaining location/heading/position of a mobile user. The Examiner argues that *Ross* teaches directing beams transmitted from the airplane based on the airplane flight pattern data. The Examiner further argues that *Barnett* teaches calculating a list of viable handoff terrestrial cell candidates based on maintaining of a fixed beam pattern the determination of location and heading of the user/airplane, the determination of locations of respective beams transmitted and the determination of locations of respective cell sites.

To establish a prima facie case of obviousness under 35 U.S.C. § 103, three requirements must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify

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the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. M.P.E.P. 2143. Since the Examiner has not established a prima facie case of obviousness the Applicant respectfully traverses this rejection.

B. There is No Motivation or Suggestion to Make the Proposed Combination.

In the response to the office action of July 30, 2003, the Applicants argued that there was no suggestion in the art to combine the references as suggested by the Examiner. Specifically, the Applicant argued that the cited art is drawn to two distinct technologies. The first technology is that of aerial communication, most notably technology to facilitate the use of a phone on an airplane. The second technology is the use of an aircraft to provide cellular/wireless communications. In the first technology, the user on the airplane is a mobile user. In the second technology the aircraft supports terrestrial (land based) mobile users by acting like a ground based base station in a cellular system, except the aircraft can cover a larger area. Nothing in the first technology discloses, teaches or suggests combining with the second technology.

The Applicant further argued that, as an example, there is no motivation or suggestion to combine *Hogg* with *Martin*, as proposed by the Examiner. *Hogg* discloses a way to provide a handoff between terrestrial cell sites of a mobile user located aboard an aircraft. *Martin* discloses an airborne system in which an aircraft is used to support broadband communication between for terrestrial based users. Nowhere in *Hogg* is there any motivation or suggestion to add the teachings of *Martin*. Adding to *Hogg* the ability to support terrestrial based communication between terrestrial based user would be futile since the aircraft in *Hogg* is traveling along a conventional flight route and would not be in a fixed area as is the aircraft of *Martin*. *Hogg* gains no advantages from the addition of sending communication beams because the beams would not be used in *Hogg* and the beams would not improve, in any way, the system and method *Hogg* uses to determine what terrestrial cell site an airborne mobile user should be using. This example clearly shows the incompatibility of the first technology (as shown in *Hogg*) and the second technology (as shown in *Martin*).

In response the Examiner argues that (1) all prior art deals with the same problems solved by the Applicant, (2) the prior art as a body of knowledge and to one skilled in the art discloses

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all the limitations as claimed by the Applicant and (3) the prior art supports Examiner's motivation to combine. These arguments, however, do not address the arguments made by the Applicant and do not support a finding of a prima facie case for obviousness.

In response to Examiner's first argument that the combination is justified because all prior art deals with the same problems solved by the Applicant, note that in order for prior art to be relevant, it must deal with the problem area of the Applicant. Just because all the art arguably deals with the same problem as the Applicant (a point the applicant disagrees with) does not mean the references contain a motivation or suggestion to make the combination. Indeed, the mere fact that a combination can be made does not mean the resultant combination is obvious unless there is a suggestion as to the desirability of the combination; although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so". In re Mills, 16 USPQ2d 1430, 1432 (Fed Cir. 1990)

In response to the second argument, that the prior art as a body of knowledge and to one skilled in the art discloses all the limitations as claimed by the Applicant, also does not support the combination as made by the Examiner. The arguments made above apply to this arguments as well. Also, just because modifications of the prior art is "well within the ordinary skill of the art at the time of the claimed invention was made" because the references relied upon teach all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the reference. MPEP 2143.01, quoting Ex Parte Levengood, 28 USPQ2d 1300 (Bd. Pat App. & Inter. 1993).

In response to the third argument, that the art supports the Examiner's reasons for making the combination, two arguments can be made. First, as noted above, just because a collection of prior art material discloses the limitations of the claimed invention, absent a suggestion or motivation to make the proposed combination, the combination suggested by the Examiner is improper even if it supports the Examiners own conclusions. Second, at least for claim 1 and most of the limitations of claim 13, the Examiner never made a showing of a motivation to combine the art, therefore there is nothing to support. Note that in rejecting claim 1, the Examiner never mentions what motivation there is for the combination of the prior art, the Examiner merely lists what the prior art discloses. At most, the Examiner states after the

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rejection of Claim 13 (not claim 1) that it would have been obvious to one skilled in the art to modify *Hogg*, such that the system uses location of beams and cell sites in footprint/vicinity to calculate handoff list, to provide means for the system to support plane based handoffs as the plane roams. However, this summary statement never shows why a specific piece of prior art provides motivation to make the combination.

For these reason, a prima facie case for obviousness has not been made and the rejection und 35 U.S.C. 103(a) should be rejected.

C. The Proposed Combination Fails to Teach All of the Limitations in the Claims.

1. Claim 1

The proposed combination also fails to disclose, teach or suggest "calculating a list of viable handoff terrestrial cell site candidates for handoffs of a terrestrial mobile user between one or more communication beams and terrestrial cell sites based on maintaining a fixed communication beam pattern, the location and heading of the airplane, the locations of each of the one or more communication beams transmitted from the airplane based on airplane flight pattern data, and the locations of respective cell sites" as in claim 1. The Examiner points to *Barnett* as disclosing this limitation. However, *Barnett* discloses a method for prioritizing handoffs of terrestrial based mobile users between terrestrial based cells using the measured RF signal strength of the mobile user. At the very least *Barnett* does not disclose calculating a list "for handoffs of a terrestrial mobile user between one or more beams and terrestrial cell sites", as *Barnett* discloses handing of a terrestrial mobile user between a first terrestrial cell site and a second terrestrial cell site. Also, *Barnett* fails to disclose that the calculation of the list is based on "the locations of each of the one or more communication beams transmitted from the airplane". *Barnett* uses the RF signal strength of a mobile user to determine handoffs and not the location of communication beams transmitted from an airplane.

This argument was made in the response to the office action of July 30, 2003. In the Office Action of January 22, 2004, the Examiner reiterates the argument that *Barnett* teaches prioritizing cells in a handoff list. This however ignores the fact that *Barnett* discloses handoffs

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from a terrestrial cell site to another terrestrial cell sites and not handoffs from a communication beam sent from an aircraft to a terrestrial cell site.

The Examiner further argues that *Barnett* reads on the claim limitation if the "mobile user" of *Barnett* is replaced with an aircraft. However, in the present invention, terrestrial mobile users communicate either via the terrestrial cell structure or via the communication beams sent from the airborne cellular system. The airplane supports mobile communication by acting as an airborne base transceiver station. When the terrestrial mobile user is communicating via a communication beam, a handoff list is generated to list possible terrestrial cell sites that the terrestrial mobile user can be handed off to. *Barnett*, as written, only discloses handoffs from one terrestrial based cell site to another. *Barnett*, as adapted by the Examiner, would have the aircraft as a mobile user that would be handed off between terrestrial cell sites (i.e. the system would be much like that disclosed in *Hogg*). So, even if the airplane was a mobile user, *Barnett* still would still not teach or suggest handoffs between "one or more beams and terrestrial cell sites." Also, claim 1, as amended, recites, in part, that the handoffs are for "a terrestrial mobile user". If the mobile user of *Barnett* is considered to be an airborne mobile unit, the combination would fail to disclose, teach or suggested the limitation of the handoff being for a "terrestrial mobile user".

For all the above reasons, claim 1 is in condition for allowance. Claims 2-12 depend from claim 1. Therefore, for at least these reasons claims 2-12 are in condition for allowance.

2. Claim 3

Considering claim 3, the Examiner argued in the office action of July 30, 2003 that *Barnett* teaches a handoff list and *Ross* teaches directing an aircraft antenna array as it moves. In response, the Applicant argued that the proposed combination does not disclose, teach, or suggest "mapping data generated from the steps of maintaining a fixed communication beam pattern, determining a location and heading of the airplane . . ." as in claim 3. There is no mapping of data done in *Barnett* and even if there was, it is not based on beams transmitted from the airplane since *Barnett* discloses a conventional earth based cell system only that determines handoffs based on received signal strength. The addition of *Ross* does not solve the shortcomings of *Barnett*. Indeed, *Ross* discloses directing an aircraft antenna from the ground to

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an aircraft, and not one or more beams transmitted by the airplane. The Examiner's response is that *Barnett* teaches a candidate cell list and *Ross* teaches directing an adaptive array. These responses address the arguments made by the Applicant; that none of the references disclose, teach or suggest mapping and none of the references disclose, teach or suggest mapping based on beams transmitted from an aircraft. For at least the above reasons, the proposed combination does not teach all of the limitations of claim 3, therefore claim 3 is allowable.

3. Claim 4

Considering claim 4, the Examiner originally argued that *Barnett* discloses "rendering each of the viable handoff terrestrial cell site candidates based on associated probability data". In response, Applicant argued that *Barnett* prioritizes handoffs based on adjusted RF signal strength (column 7, lines 32-35), which is not a probability calculation. The Examiner claims in the office action of February 22, 2004 that it is known to those skilled in the art that handoffs are based on probability. Since *Barnett* does not mention the use of probability, the Applicant assumes that the Examiner is taking official notice of the fact handoffs are calculated using probabilities. As noted in the MPEP at section 2144.03, "Official notice without documentary evidence to support an examiner's conclusion is permissible only in some circumstances. While "official notice" may be relied on, these circumstances should be rare when an application is under final rejection or action under 37 CFR 1.113. Official notice unsupported by documentary evidence should only be taken by the examiner where the facts asserted to be well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well-known." (emphasis added) The Applicant argues that this is not the case. The intricacies of how handoffs occur in a cellular system are certainly not the type of facts that is capable of instant demonstration as being well-known. The only art of record cited to this point, *Barnett*, makes no mention of probability calculation in determining handoffs. However, known handoff techniques measure signal strength and based on the increasing or decreasing signal strength determines where the handoff occurs. Additionally, the Examiner's official notice was conclusionary and wholly without basis. Again, as stated in the MPEP section 2144.03, "The examiner must provide specific factual findings predicated on sound technical and scientific reasoning to support his or her conclusion of common knowledge. The applicant

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should be presented with the explicit basis on which the examiner regards the matter as subject to official notice and be allowed to challenge the assertion in the next reply after the Office action in which the common knowledge statement was made." See In re Soli, 317 F.2d 941, 946, 137 USPQ 797, 801 (CCPA 1963); In re Chevenard, 139 F.2d 711, 713, 60 USPQ 239, 241 (CCPA 1943). Therefore, the applicant respectfully request the Examiner provide authority for his assertion on the common use of probability in handoff calculations. For at least the above reasons, the proposed combination does not teach all of the limitations of claim 4, therefore claim 4 is allowable.

4. Claim 6

Considering claim 6, the Examiner argues that *Hogg* discloses calculating a list of cell sites for each of the respective beams transmitted from the airplane. However, *Hogg*, as discussed earlier, discloses handing off an airborne conversation from one terrestrial site to another terrestrial site. Therefore, there is no "calculating of a list of viable handoff terrestrial cell site candidates for handoffs of a terrestrial mobile user between one or more communication beams and terrestrial cell sites is performed for each of the one or more communication beams transmitted from the airplane" (emphasis added). Also, in *Hogg* the mobile unit is not a terrestrial mobile unit, it is in an aircraft. Thus, *Hogg* does not disclose, teach or suggest "handoffs of a terrestrial mobile user".

The Examiner in the response of January 22, 2004, argued that FIG. 2, #40 and column 4, lines 29-54 read on this claim. However, the airplane in *Hogg* is the mobile user, not part of an airborne cellular system supporting terrestrial mobile users. Thus, *Hogg* only shows that the mobile user in the plane will be handed off between one terrestrial base station to another and not the handoff of a terrestrial mobile use. For at least the above reasons, the proposed combination does not teach all of the limitations of claim 3, therefore claim 3 is allowable..

5. Claim 13

Considering independent claim 13, claim 13 is allowable for the same reasons as claim 1. For example, the proposed combination fails to disclose, teach or suggest "calls to be handed off

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from the communications beams transmitted from the airplane to terrestrial cell sites." For at least this reason, claim 13 is allowable.

Claims 14 and 16-20 depend from allowable independent claim 13. For at least this reason, claims 14 and 16-20 are allowable.

6. Claim 14

Considering claim 14, claim 14 recites, in part "wherein the flight pattern information comprises airplane location, heading, and beam footprint information". The Examiner argues that this limitation can be found in *Ross*, *Martin*, *Upton* and *Alanara* in conjunction with *Hogg*. However, *Ross* discloses directing a lobe of an antenna to an aircraft and is thus not "beam footprint information". *Martin* may show antenna footprints in FIG. 2, but does not disclose flight information comprising airplane location, heading and beam footprint information. The Examiner further argues that *Martin*, *Ross*, *Upton* and *Alanara* all disclose the location/heading/position of a "mobile user" which is equivalent to the flight information of claim 14. However, as the Examiner points out, and as has been discussed previously, these references disclose the movement of a "mobile user". The aircraft in the present invention is part of a cellular system supporting terrestrial mobile users and is not itself a mobile user. Because the proposed combination does not disclose all the limitations of claim 14, claim 14 is allowable. Therefore, the rejection to claim 14 should be withdrawn.

7. Claim 15

Claim 15 stands rejected under 35 U.S.C. 103(a) as unpatentable over *Hogg/Martin* and further in view of European Patent No. EP0837567 to *Ayyagari* (hereinafter "*Ayyagari*") and presumably *Barnett* as well. Specifically, the Examiner argues the *Hogg/Martin* combination discloses all of claim 15 except for the use of a database and processor implemented in ground-based base stations. The Examiner argues that *Barnett* teaches ground based communication systems and *Ayyagari* teaches ground-based communication systems for airborne broadband communication networks.

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The prior argument that there is not motivation or suggestion in *Hogg* to combine with *Martin* applies to claim 15. For at least the above reasons, the proposed combination does not teach all of the limitations of claim 15, therefore claim 15 is allowable.

D. New Claims

New claims 21 and 22 disclose ranking the cell site candidate list based on the relative density of each handoff cell site candidate. This limitation is not found in any of the prior art references. Therefore, claims 21 and 22 are allowable.

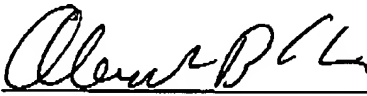
II. CONCLUSION

For the foregoing reasons, the present application is believed to be in condition for allowance and favorable action is respectfully requested. The Examiner is invited to telephone the undersigned at the telephone number listed below if it would in any way advance prosecution of this case.

While no other fees are believed due, the applicant hereby requests that any other required fee to maintain pendency of this case, except for the Issue Fee, be charged to Deposit Account 50-2091.

Respectfully submitted,

April 22, 2004
Date

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